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09/924,722	08/09/2001	Balaji Lakshmikanth Bangolae	CSCO-009/4342	3956

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EXAMINER	
NG, CHRISTINE Y	
ART UNIT	**PAPER NUMBER**
2663	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/924,722	BANGOLAE ET AL.	
	Examiner	Art Unit	
	Christine Ng	2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9-13,18-28 and 33-36* is/are rejected.

7)☒ Claim(s) *5-8,14-17 and 29-32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 August 2001* is/are: a)☒ accepted ~~or~~ b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims, 1-3, 9-12, 18-23 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,424,629 to Rubino et al.

Referring to claim 1, Rubino et al disclose in Figure 4 a method of determining the status of a bi-directional virtual circuit (PVC) in a first end system (ATM router 108), wherein said bi-directional circuit (PVC) is provisioned between said first end system (ATM router 108) and another end system (ATM router 102). Refer to Column 6, lines 59-63. The method comprises:

Receiving in said first end system (ATM router 108) a plurality of loopback command packets (116,118) from said another end system (ATM router 102) on said bi-directional virtual circuit (PVC). Refer to Column 6, line 58 to Column 7, line 1.

Sending from said first end system (ATM router 108) a plurality of loopback response packets (120,122) to said another end system (ATM router 102), wherein said another end system (ATM router 108) determines that said bi-directional virtual circuit (PVC) is operational based on the reception of said plurality of said response packets (120,122). Refer to Column 7, lines 1-23 and Column 8, lines 15-34.

Rubino et al do not specifically disclose the step of concluding in said first end system (ATM router 108) that said bi-directional virtual circuit (PVC) is operational according to the determination of said another end system (ATM router 102).

However, Rubino discloses that after ATM router 102 determines which PVC's have failed or have been restored, it "advertises the updated routing information to the other ATM routers". Refer to Column 9, lines 53 to Column 10, lines 30. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the step of concluding in said first end system that said bi-directional virtual circuit is operational according to the determination of said another end system, the motivation being so that the first end system will be able to know which paths are functional in order to transmit and receive data.

Referring to claim 2, 11, 22 and 26, Rubino et al do not disclose examining a receive frequency at which said plurality of loopback command packets are received and determining that said bi-directional virtual circuit is operational if said receive frequency does not change substantially.

However, Rubino et al disclose that an ATM router 102 repeatedly receives AIS signals at a frequency of one-second intervals while a PVC failure persists. The ATM router 102 determines that the PVC is operational once it stops receiving AIS signals for a predetermined time, preferably three seconds. Refer to Column 6, lines 37-57. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include examining a receive frequency at which said plurality of loopback command packets are received and determining that said bi-directional virtual

circuit is operational if said receive frequency does not change substantially, the motivation being so that an end router will be able to determine when a failure occurs and when the failure is restored based on the rate of the loopback signals.

Referring to claim 3, 12, 23 and 27, Rubino et al disclose in Figure 4 that said bi-directional virtual circuit (PVC) comprises a permanent bi-directional virtual circuit provisioned on an ATM backbone (ATM network 104), and each of said plurality of loopback command packets (Figure 8) and plurality of loopback response packets (Figure 9) comprises a cell. Refer to Column 5, lines 7-14; Column 6, lines 59-63; and Column 7, line 24 to Column 8, line 14.

Referring to claims 9 and 18, Rubino et al disclose in Figure 4 that each of said first end system (ATM router 108) and said another end system (ATM router 102) comprises an edge router. Refer to Column 6, lines 59-63.

Referring to claim 10, Rubino et al disclose in Figure 4 a first end system (ATM router 108) determining the status of a bi-directional virtual circuit (PVC), wherein said bi-directional virtual circuit (PVC) is provisioned between said first end system (ATM router 102) and another end system (ATM router 108) on a network backbone. The first end system (ATM router 108) comprise (Figures 10A-10C show components of router 102; however, since routers 102 and 108 are both ATM routers, they have the same components):

An interface (Figure 10A, physical layer logic 1010) coupled to said network

backbone (ATM network 104), said interface receiving a plurality of loopback command packets (116,118) from said another end system (ATM router 102) on said bi-directional virtual circuit (PVC). Refer to Column 9, lines 6-8.

A memory (Figure 10A, routing table) storing information indicating whether said bi-directional virtual circuit (PVC) is operational. Refer to Column 9, line 53 to Column 10, line 14.

A processor (Figure 10A, ATM layer logic 1008) sending a plurality of loopback response packets (120,122) to said another end system (ATM router 102) in response to receiving said plurality of loopback command packets (116,118), wherein said another end system (ATM router 102) determines that said bi-directional virtual circuit (PVC) is operational based on the reception of said plurality of said response packets (120,122). Refer to Column 10, lines 15-34; Column 10, line 40 to Column 11, line 30; and Column 12, line 12 to Column 13, line 30.

Rubino et al do not specifically disclose that the said processor (Figure 10A, ATM layer logic 1008) stores data in said memory (Figure 10A, routing table) indicating that said bi-directional virtual circuit (PVC) is operational if said another end system (ATM router 102) determines that said bi-directional virtual circuit (PVC) is operational.

However, Rubino et al disclose that after ATM router 102 determines which PVC's have failed or have been restored, it "advertises the updated routing information to the other ATM routers". Refer to Column 9, lines 53 to Column 10, lines 30. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the step of concluding in said first end system that said

bi-directional virtual circuit is operational according to the determination of said another end system, the motivation being so that the first end system will be able to know which paths are functional in order to transmit and receive data.

Referring to claim 19, Rubino et al disclose in Figure 4 that said memory stores a VC table (routing table), wherein said VC table (routing table) stores data indicating whether said bi-directional virtual circuit (PVC) is operational. Refer to Column 9, line 53 to Column 10, line 14.

Referring to claim 20, Rubino et al disclose in Figure 4 that data packets are transmitted on said bi-directional virtual circuit (PVC) only if said memory (routing table) indicates that said bi-directional virtual circuit (PVC) is operational. Refer to Column 9, line 53 to Column 10, line 14.

Referring to claim 21, Rubino et al disclose in Figure 4 a first end system (ATM router 108) determining the status of a bi-directional virtual circuit (PVC), wherein said bi-directional virtual circuit (PVC) is provisioned between said first end system (ATM router 108) and another end system (ATM router 102) on a network backbone (ATM network 104). Refer to Column 6, lines 59-63. The first end system (ATM router 108) comprise (Figures 10A-10C show components of router 102; however, since routers 102 and 108 are both ATM routers, they have the same components):

Means (Figure 10A, physical logic layer 1010) for receiving a plurality of loopback command packets (116,118) from said another end system (ATM router 102) on said bi-directional virtual circuit (PVC). Refer to Column 9, lines 6-8.

Means (Figure 10A, physical logic layer 1010) for sending a plurality of loopback response packets (120,122) to said another end system (ATM router 102), wherein said another end system (ATM router 102) determines that said bi-directional virtual circuit (PVC) is operational based on the reception of said plurality of said response packets (120,122). Refer to Column 8, lines 15-34 and Column 9, lines 6-8.

Means (Figure 10A, routing table) for storing data indicating whether said bi-directional virtual circuit (PVC) is operational or not. Refer to Column 9, line 53 to Column 10, line 14.

Rubino et al do not specifically disclose that the means (Figure 10A, ATM layer logic 1008) concludes that said bi-directional virtual circuit (PVC) is operational according to the determination of said another end system (ATM router 102), wherein said means (Figure 10A, ATM layer logic 1008) for concluding causes said means for storing (Figure 10A, routing table) to store data to indicate that said bi-directional virtual circuit (PVC) is operational. Refer to Column 10, line 40 to Column 11, line 30; and Column 12, line 12 to Column 13, line 30.

However, Rubino discloses that after ATM router 102 determines which PVC's have failed or have been restored, it "advertises the updated routing information to the other ATM routers". Refer to Column 9, lines 53 to Column 10, lines 30. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the step of concluding in said first end system that said bi-directional virtual circuit is operational according to the determination of said another end system,

the motivation being so that the first end system will be able to know which paths are functional in order to transmit and receive data.

Referring to claim 25, refer to the rejection of claim 1. Furthermore, Rubino et al disclose that the processors inside ATM routers 102 and 108 (Figures 10A-10C) can be implemented as a computer readable medium carrying one or more sequences of instructions. Refer to Column 15, lines 13-22.

3. Claims 4, 13, 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,424,629 to Rubino et al in view of U.S. Patent No. 5,659,540 to Chen et al.

Rubino et al do not disclose that said plurality of loopback command packets and said plurality of loopback response packets are generated consistent with ITU-T Recommendation I.610.

Chen et al disclose in Figure 1 that loopback command packets and loopback response packets are generated consistent with ITU-T Recommendation I.610 since this standard sets forth the use of OAM cells to provide "performance monitoring, defect and failure detection, system protection, defect information, and fault localization functions". Refer to Column 1, lines 47-51; Column 2, lines 13-23 and Column 2, line 51 to Column 3, line 23. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that said plurality of loopback command packets and said plurality of loopback response packets are generated consistent with ITU-T Recommendation I.610, the motivation being that the ITU-T Recommendation I.610 provides standards for the use of OAM cells.

4. Claims 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,424,629 to Rubino et al in view of U.S. Patent No. 5,870,428 to Miller et al.

Referring to claims 33, 35 and 36, Rubino et al do not disclose that said another end system sends said plurality of loopback command packets according to a first pattern if said another end system determines that said bi-directional virtual circuit is operational and according to a second pattern otherwise wherein said concluding is based on the pattern with which said plurality of loopback command packets are received from said another end system.

Miller et al disclose in Figures 1-3 that a local DDU 101 transmit a first protocol signal to the remote DDU 103. The remote unit 103 (another end system) generates a first pattern (acknowledge pattern) in response to the first protocol signal and sends it to the local DDU 101 (first end system). If the acknowledge pattern is detected, the local receiver sends a test successful flag to the controller, which notifies the local DTE 100 that the remote loopback test is successful. If a second pattern (no acknowledge pattern) is sent after a predetermined number of times, the test failed flag is sent to the controller. Refer to Column 2, lines 17-30 and Column 4, lines 12-40. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that said another end system sends said plurality of loopback command packets according to a first pattern if said another end system determines that said bi-directional virtual circuit is operational and according to a second pattern otherwise wherein said concluding is based on the pattern with which said plurality of

loopback command packets are received from said another end system; the motivation being to provide a method of notifying the first end system of failed loopback tests using patterns of the loopback tests, thereby efficiently utilizing resource by avoiding extra signaling to provide notification.

Referring to claim 34, refer to the rejection of claim 10 and the rejection of claims 33, 35 and 36. If the first pattern (acknowledge pattern) is received, the loopback test was successful and the processor (Figure 10A, ATM layer logic 1008) stores data in said memory (Figure 10A, routing table) indicating that the PVC is operational.

Allowable Subject Matter

5. Claims 5-8, 14-17 and 29-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments filed March 17, 2005 have been fully considered but they are not persuasive.

Referring to the argument of independent claim 1 (page 12, line 15 to page 15, line 7) that Rubino et al does not disclose using layer 3 routers to determine that logical connections are not operational, refer to Figures 10A-10B. Rubino et al disclose that the ATM router exchange information with other routers on the status of logical connections. However, Rubino et al also disclose "the connection between two routers is referred to hereinafter as a "logical connection"" (Column 1, lines 45-47). Also, "A logical channel can be a physical communication channel..." and "can be a physical

layer channel or subchannel" (Column 1, lines 50-53). Each router "maintains a routing table that effectively maps the destination to one of the logical connections supported by the router" and "selects a preferred logical connection for the destination based upon, among other things, routing information received from other routers in the network" (Column 1, line 67 to Column 2, line 5). Routing information about the logical connections at the lower layer is "implemented at a routing protocol layer above the logical channel protocol layer" (Column 2, lines 5-13). Refer also to Column 2, lines 14-34 and Column 4, lines 47-61. In Figure 4, "each logical connection consists of one or more PVCs" and "A logical connection is considered to be active if at least one of its constituent PVCs is active" (Column 5, lines 15-21). Furthermore, refer to Figure 10B which shows the ATM Layer Logic 1008 of the ATM router. The ATM Call Control Logic 1030 manages the ATM PVCs for the ATM router by receiving PVC status information from the PVC Monitoring Logic 1050 and relaying the PVC Status information to the Data Path Control Logic 1014. Data Path Control Logic 1014 sends a signal to network Layer Logic 1006 indicating when a logical connection, consisting of PVCs, has failed. Refer to Column 10, line 31 to Column 11, line 30. Therefore, the status of the bi-directional virtual circuit (PVC) at the lower layer is based on the routing information passed between the routers at the higher layer. The routers distribute information to other routers on the status of "logical connections" which can be a "physical layer channel", since each logical connection consists of "one or more PVCs" which connect ATM routers.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Ng whose telephone number is (571) 272-3124. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Ng
May 25, 2005

RICKY NGO
PRIMARY EXAMINER

6/12/05